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VARIETY TESTS OF SUGARCANES IN LOUISIANA DURING THE CROP YEAR 1933–34 AND SUMMARY OF ANNUAL RESULTS 1926–34

By George Arceneaux, *agronomist*, and I. E. Stokes and C. C. Krumbhaar, *agents, Division of Sugar Plant Investigations, Bureau of Plant Industry* [1]

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INTRODUCTION

The principal sugarcane-producing districts of southern Louisiana consist mainly of soils ranging from very fine sandy loam to silty clay loam, usually found in belts bordering silt-bearing streams. Farther removed from the streams are extensive heavy clay areas on which cane is produced but which, because of poor drainage resulting from their slight elevation above swamp levels and their comparative impermeability to water, have generally proved less satisfactorily adapted for its culture. The very fertile reclaimed muck areas which also occur have demonstrated capacities for exceedingly high yields of cane per acre. However, because of the relatively poor milling quality of cane produced under such conditions with previously available disease-resistant varieties such soils have not been extensively utilized for the production of sugarcane.

The P. O. J. varieties 36, 36–M, 213, and 234, as well as the variety Co. 281, although making comparatively satisfactory growth on the well-drained sandy and silty clay areas, have not proved adaptable to the poorly drained heavy clay areas. The variety C. P. 807, released by the United States Department of Agriculture for commercial cultivation in the fall of 1930, and the subsequently introduced variety, Co. 290, have given good results on clay soils and are now being extensively cultivated on such areas.

[1] Acknowledgment is made to the Division of Soil Fertility Investigations and to A. M. O'Neal, of that Division, for valued cooperation in the phase of the investigation involving a study of the relation between soil type and varietal performance, and in identifying the characteristic soil types of plots of land on which variety tests were carried on.

In the past, the occasional plantings of sugarcane on Louisiana muck soils consisted largely of the early maturing but exceedingly disease-susceptible variety, D–95. In the main, sugarcane cultivation under such conditions has been a questionable venture.

Results of sugarcane variety tests conducted in Louisiana during the crop year 1933–34 are given in this report. While many of the data shown are largely corroborative of previously expressed conclusions drawn from the results of similar tests in the past, the information secured with regard to the adaptability of the two newly released varieties, C. P. 28/19 and C. P. 28/11, as a result of extensive plantation trials conducted during 1934, is considered of extreme importance to all sugarcane growers of Louisiana.

SEASONAL CONDITIONS

The first severe freeze of the 1933–34 winter occurred on January 9, 1934, thus affording conditions permitting fall-planted cane to make much more prewinter growth than under normal conditions. Frequent light freezes and frosts during the late winter and early spring months delayed the incipience of spring growth considerably beyond the normal period. The minimum temperatures experienced at Houma, however, did not prove sufficiently severe to kill the sugarcane growth down to the ground level in all cases. This was particularly true in early planted plots of C. P. 807 and Co. 290 where many of the younger shoots were effectively protected by surrounding foliage.

As indicated by the data given in table 1, rainfall during the growing season proved generally adequate, thus resulting in conditions during the summer months somewhat more favorable than normal. A hurricane, accompanied by wind velocities approximating 60 miles per hour near the center of the disturbance, swept across the Louisiana sugar belt on June 16, 1934. At that comparatively early date, sugarcane was not sufficiently developed to be susceptible to excessive breakage and the damage was accordingly light. The varieties Co. 281 and C. P. 28/11 demonstrated their susceptibility to wind injury by the relatively high percentage of breakage among their older shoots.

TABLE 1.—*Amount and distribution of rainfall at 7 sugarcane test fields in Louisiana during 1934*

Station	January		February		March		April		May		June		July	
	Days	Inches	Days	Inches	Days	Inches	Days	Inches	Days	Inches	Days	Inches	Days	Inches
Albania	9	8.18	7	6.25	4	4.42	4	2.35	9	4.95	9	11.91	14	7.60
Alma	4	3.25	6	6.75	3	3.50	6	2.42	8	8.00	4	7.75	6	5.50
Clovelly	8	4.46	5	4.63	6	7.58	6	2.46	9	12.77	6	4.29	10	8.16
Greenwood	9	6.20	6	2.85	5	3.50	8	1.70	12	9.33	10	8.48	15	8.30
Oaklawn	8	7.00	6	4.40	3	2.66	4	1.40	13	8.50	8	9.85	10	7.35
Raceland	12	7.45	6	1.75	8	3.64	5	3.04	11	9.24	11	6.68	11	4.89
Houma	11	6.94	5	2.31	3	2.55	7	2.83	10	3.72	11	6.47	14	7.33
Normal for Houma [1]	----	4.02	----	4.37	----	3.70	----	3.89	----	3.83	----	6.05	----	8.56

[1] Average precipitation during period 1888–1930, inclusive (*10*). Italic numbers in parentheses refer to Literature Cited, p. 30.

TABLE 1.—*Amount and distribution of rainfall at 7 sugarcane test fields in Louisiana during 1934*—Continued

Station	August		September		October		November		December		Total	
	Days	Inches	Days	Inches	Days	Inches	Days	Inches	Days	Inches	Days	Inches
Albania	13	13.49	5	6.77	2	2.25	6	11.14	3	2.55	85	81.86
Alma	4	4.25	4	4.87	2	2.75	5	8.50	3	2.75	55	60.29
Clovelly	15	17.51	3	2.38	3	1.50	6	6.23	4	2.91	81	74.88
Greenwood	17	11.05	3	1.15	2	4.70	7	7.80	5	3.25	99	68.31
Oaklawn	13	13.00	3	1.40	4	5.60	7	7.20	3	1.30	82	69.66
Raceland	13	10.28	9	3.97	3	3.87	7	4.85	5	2.35	101	62.01
Houma	16	12.71	7	1.93	4	3.66	6	6.24	4	1.92	98	58.61
Normal for Houma [1]	----	7.21	----	5.65	----	4.07	----	3.76	----	4.81	----	59.92

[1] Average precipitation during period 1888–1930, inclusive (*10*). Italic numbers in parentheses refer to Literature Cited, p. 30.

Fall weather conditions, characterized by more or less normal rainfall and seasonal to cool temperatures, proved favorable to the ripening of sugarcane as indicated by the rapid rise in indicated yield of sugar per ton of cane between September 5 and November 15. On November 13 a minimum temperature of 31° F. was recorded at Houma, which, while resulting in no evident damage more severe than slight leaf-tip discoloration, had the apparent effect of abruptly checking the growth of cane as well as the rise in available sugar per ton of cane. Minimum temperatures generally ranging from 19° to 27° were recorded throughout the Louisiana sugarcane district during the 3-day period of December 11–13, inclusive, and caused severe injury followed by relatively rapid deterioration in standing cane of all varieties.

Co. 290 almost invariably showed the greatest apparent damage and the most rapid deterioration. Indicated yields of sugar per ton of cane observed in plant tests with four important varieties of sugarcane at different dates within the period September 5 to December 28, inclusive, at the United States Sugar Plant Field Station near Houma, graphically represented in figure 1, show the previously mentioned

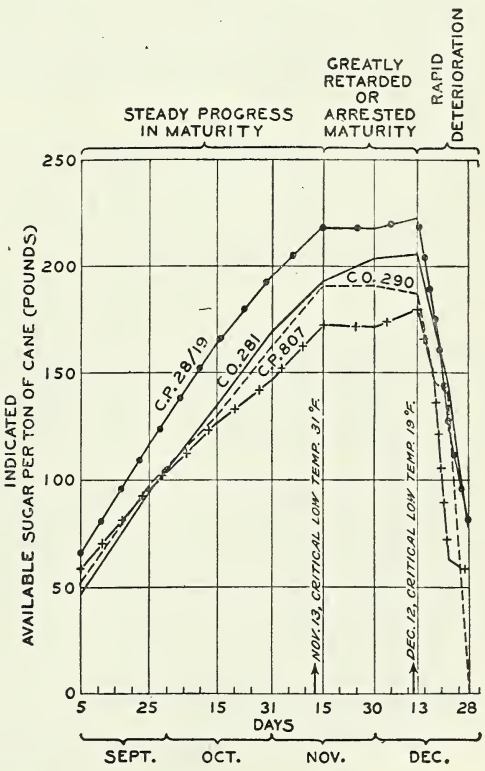

FIGURE 1.—Changes in available sugar per ton of standing plant cane observed with four varieties at the United States Sugar Plant Field Station, Houma, La., during the period September 5 to December 28, 1934.

rapid rise in available sugar per ton of cane during September, October, and early November, and illustrate the response of the different varieties to the two levels of critical temperature experienced. The data are representative of conditions in 1934 only, and may be expected to vary from season to season in accordance with prevailing weather conditions.

EXPERIMENTAL METHODS

Methods of plot technique, field sampling, sugar-yield calculations, and statistical reduction employed have been described in previous publications (*3*, *4*). Field plots of one-fortieth of an acre arranged in Latin square order are replicated sufficiently to reduce to a practical minimum the effects of soil variations and other environmental factors on average observations.

Following cutting of the cane for plot-weight determinations, a 40-stalk sample of cane is taken from each individual plot and brought to the United States Sugar Plant Field Station near Houma for milling and juice analysis. Sugar-yield calculations are made by the Winter-Carp formula, using the following milling and recovery factors: Assumed juice extraction 76 percent; reduction factors to convert laboratory-mill juice analyses to the basis of completed milling, Brix, 0.985; sucrose, 0.970; boiling house efficiency number=100 percent.

In order to compensate for differences in milling properties between different varieties, the following "varietal correction factors" based on repeated comparative milling tests conducted in accordance with methods previously described (*3*) are applied to results of sugar-yield calculations as set forth above:

(1) For C. P. 807, C. P. 28/19, and C. P. 28/11, correction factor=0.98.

(2) For Co. 281, P. O. J. 234, P. O. J. 36–M, P. O. J. 213, C. P. 29/291, and C. P. 29/320, correction factor=1.00 (no correction).

(3) For Co. 290 and D–95, correction factor=1.06.

Statements throughout this circular concerning sugar yields refer to indicated available 96° sugar calculated according to the above methods.

Statistical calculations are based on the analysis of variance method described by Fisher (*7*). The significance of observed averages is expressed in terms of differences between comparable averages which correspond to the two commonly accepted levels of statistical significance, viz: For P=0.05 and for P=0.01. As a matter of chance alone, a difference corresponding to P=0.05 may be expected only 5 times, and one corresponding to P=0.01 only once in 100 comparable trials. Differences of the latter order of magnitude are usually regarded as definitely significant.

TESTS ON LIGHT SOILS

Tables 2, 3, 4, and 5 give detailed results of plant-cane and of first- and second-stubble tests conducted on the predominant light soil type at each of several representative localities within the Louisiana sugarcane district. Varietal trends observed in connection with these tests fully confirm results obtained in similar comparative tests in previous years and, in addition, afford important information

with regard to relative adaptability of the new C. P. varieties 28/11, 28/19, 29/291, and 29/320, on which relatively few field comparisons were previously available.

TABLE 2.—*Results of plant-cane variety tests on light soil in Louisiana during 1934*

ON YAZOO VERY FINE SANDY LOAM, UNITED STATES SUGAR PLANT FIELD STATION, HOUMA (HARVESTED DEC. 13-19)

Variety [1]	Average acre yield of cane	Laboratory-mill juice analyses at harvest			Indicated available 96° sugar at harvest		Cane for 1 ton of sugar
		Brix	Sucrose	Purity	Per ton of cane	Per acre	
	Tons [2]		*Percent*		*Pounds*	*Pounds*	*Tons*
P. O. J. 36-M	26.82	15.07	11.92	79.10	162.3	4,353	12.32
P. O. J. 213	24.20	14.96	11.99	80.15	164.5	3,981	12.16
P. O. J. 234	23.77	15.71	12.52	79.69	171.2	4,069	11.68
Co. 281	31.21	16.54	13.63	82.41	189.9	5,927	10.53
Co. 290	44.70	16.26	12.86	79.09	185.6	8,296	10.78
C. P. 807	38.13	15.34	12.23	79.73	163.9	6,249	12.20
C. P. 28/11	26.57	17.83	14.30	80.20	192.3	5,109	10.40
C. P. 28/19	34.28	17.65	14.73	83.46	202.5	6,942	9.88
Difference for P=0.05	2.20				[3]		
Difference for P=0.01	2.94				[3]		

ON YAZOO VERY FINE SANDY LOAM, GREENWOOD PLANTATION, THIBODAUX (HARVESTED DEC. 6)

P. O. J. 234	20.94	16.70	14.28	85.51	202.9	4,249	9.86
Co. 281	24.26	16.73	14.31	85.53	203.3	4,932	9.84
Co. 290	35.32	16.41	13.17	80.26	191.7	6,771	10.43
C. P. 807	32.56	15.64	12.90	82.48	176.2	5,737	11.35
C. P. 28/11	21.54	18.17	15.23	83.82	209.8	4,519	9.53
C. P. 28/19	25.94	18.69	16.53	88.44	234.1	6,073	8.54
Difference for P=0.05	2.30				6.2	571	
Difference for P=0.01	3.07				8.3	763	

ON YAZOO VERY FINE SANDY LOAM, GODCHAUX PLANTATION, RACELAND (HARVESTED DEC. 17)

P. O. J. 234	11.24	13.97	10.70	76.59	142.9	1,606	14.00
Co. 281	20.82	15.42	12.52	81.19	173.0	3,602	11.56
Co. 290	33.30	15.65	12.28	78.47	176.4	5,874	11.34
C. P. 807	28.76	14.43	11.54	79.97	154.9	4,455	12.91
C. P. 28/11	17.97	16.49	12.94	78.47	171.8	3,087	11.64
C. P. 28/19	23.16	16.54	13.65	82.53	186.5	4,319	10.72
Difference for P=0.05	2.11				7.2	391	
Difference for P=0.01	2.82				9.7	522	

ON PHARR SILT LOAM, OAKLAWN PLANTATION, FRANKLIN (HARVESTED DEC. 10)

P. O. J. 234	12.14	18.39	16.26	88.42	234.9	2,852	8.51
Co. 281	13.95	18.03	15.77	87.47	226.6	3,161	8.83
Co. 290	21.08	17.82	15.03	84.34	224.7	4,737	8.90
C. P. 807	19.15	16.91	14.65	86.64	205.3	3,931	9.74
C. P. 28/11	12.68	19.00	16.00	84.21	221.0	2,802	9.05
C. P. 28/19	15.31	19.61	17.55	89.50	249.9	3,826	8.00
Difference for P=0.05	1.33				5.9	319	
Difference for P=0.01	1.78				7.9	426	

[1] Many varieties of sugarcane are commonly designated by letters or other abbreviations indicating the origin of the seedling cane. The meanings of such designations for the varieties mentioned throughout this circular are as follows: Co.=Coimbatore (India) seedlings; C. P.=Canal Point (Fla.) seedlings; P. O. J.=Proefstation Oost Java seedlings; P. O. J. 36-M=Mingka selections of P. O. J. 36.

[2] Tons of 2,000 pounds are used in all tests reported in this circular.

[3] Juice from individual samples composited for analysis and significance of observed varietal differences, therefore, not measurable.

TABLE 2.—*Results of plant-cane variety tests on light soil in Louisiana during 1934*—Continued

ON IBERIA SILT LOAM, LEON J. LANDRY PLANTATION (HARVESTED NOV. 29)

Variety	Average acre yield of cane	Laboratory-mill juice analyses at harvest			Indicated available 96° sugar at harvest		Cane for 1 ton of sugar
		Brix	Sucrose	Purity	Per ton of cane	Per acre	
	Tons		*Percent*		*Pounds*	*Pounds*	*Tons*
P. O. J. 234	12.99	15.82	13.27	83.88	186.6	2,424	10.72
Co. 281	18.78	17.13	14.90	86.98	213.5	4,010	9.37
Co. 290	29.94	16.72	13.46	80.50	196.2	5,874	10.19
C. P. 807	21.70	15.66	13.22	84.42	182.8	3,967	10.94
C. P. 28/11	19.31	18.70	15.97	85.40	222.2	4,291	9.00
C. P. 28/19	22.65	18.41	16.11	87.51	226.9	5,139	8.81
Difference for P=0.05	2.84				11.1	650	
Difference for P=0.01	3.87				15.1	886	

ON IBERIA SILT LOAM, ALBANIA PLANTATION, JEANERETTE (HARVESTED DEC. 12)

P. O. J. 234	17.43	17.51	15.10	86.24	215.4	3,754	9.28
Co. 281	21.28	17.29	15.21	87.97	219.2	4,665	9.12
Co. 290	32.04	17.54	14.42	82.21	212.7	6,815	9.40
C. P. 807	27.38	16.52	14.07	85.17	195.5	5,353	10.23
C. P. 28/11	17.62	18.80	16.22	86.28	226.8	3,996	8.82
C. P. 28/19	20.44	18.62	16.60	89.15	236.0	4,824	8.47
Difference for P=0.05	1.87				[3]		
Difference for P=0.01	2.50				[3]		

ON VERMILION SILT LOAM, CALDWELL PLANTATION, ERATH (HARVESTED NOV. 28)

P. O. J. 234	14.43	17.48	15.38	87.99	221.6	3,198	9.03
Co. 281	18.46	17.71	15.58	87.97	224.5	4,144	8.91
Co. 290	29.22	17.62	14.41	81.78	211.9	6,192	9.44
C. P. 807	26.60	16.59	14.17	85.41	197.2	5,246	10.14
C. P. 28/11	14.83	19.12	16.27	85.09	225.9	3,350	8.85
C. P. 28/19	21.24	19.04	16.73	87.89	236.1	5,015	8.47
Difference for P=0.05	2.63				14.8	532	
Difference for P=0.01	3.58				20.2	725	

ON YAZOO VERY FINE SANDY LOAM, ALMA PLANTATION, LAKELAND (HARVESTED DEC. 3)

P. O. J. 234	25.51	17.18	14.29	83.18	200.1	5,015	9.99
Co. 281	22.61	16.96	13.81	81.43	191.1	4,321	10.47
Co. 290	39.37	16.43	12.67	77.18	180.1	7,091	11.10
C. P. 807	33.53	16.78	13.94	83.07	191.2	6,411	10.46
C. P. 28/11	30.18	17.55	13.48	76.81	176.8	5,336	11.31
C. P. 28/19	26.84	18.70	15.78	84.38	218.2	5,856	9.17
Difference for P=0.05	2.32				5.9	496	
Difference for P=0.01	3.09				7.8	662	

ON YAHOLA VERY FINE SANDY LOAM, ROSEWOOD PLANTATION (HARVESTED DEC. 12)

P. O. J. 234	31.17	16.09	12.93	80.36	177.6	5,536	11.26
Co. 281	27.48	15.69	12.35	78.71	167.7	4,608	11.93
Co. 290	46.12	14.29	10.01	70.05	133.7	6,166	14.96
C. P. 807	40.83	14.69	11.03	75.08	142.6	5,822	14.03
C. P. 28/11	31.80	15.69	11.45	72.98	145.3	4,621	13.76
C. P. 28/19	33.37	17.09	13.97	81.74	189.9	6,337	10.53
Difference for P=0.05	5.21				[3]		
Difference for P=0.01	7.90				[3]		

[3] Juice from individual samples composited for analysis and significance of observed varietal differences, therefore, not measurable.

TABLE 3.—*Results of first-stubble variety tests on light soil in Louisiana during 1934*

ON CREVASSE SILTY CLAY LOAM, UNITED STATES SUGAR PLANT FIELD STATION, HOUMA (HARVESTED NOV. 13)

Variety	Average acre yield of cane	Laboratory-mill juice analyses at harvest			Indicated available 96° sugar at harvest		Cane for 1 ton of sugar
		Brix	Sucrose	Purity	Per ton of cane	Per acre	
	Tons		*Percent*		*Pounds*	*Pounds*	*Tons*
P. O. J. 36–M	25.40	15.75	13.00	82.54	181.3	4,605	11.03
P. O. J. 213	21.76	16.72	14.35	85.83	204.2	4,443	9.79
P. O. J. 234	16.59	17.19	14.67	85.34	208.2	3,454	9.61
Co. 281	29.38	17.09	14.47	84.67	204.5	6,008	9.78
Co. 290	41.74	16.07	12.89	80.21	187.5	7,826	10.67
C. P. 807	34.77	15.62	13.16	84.25	181.8	6,321	11.00
C. P. 28/19	31.52	18.90	16.59	87.74	234.0	7,376	8.55
Difference for P=0.05	1.82				(1)		
Difference for P=0.01	2.42				(1)		

ON YAZOO VERY FINE SANDY LOAM, GREENWOOD PLANTATION, THIBODAUX (HARVESTED NOV. 20)

P. O. J. 36–M	15.43	16.51	14.36	86.98	205.8	3,175	9.72
P. O. J. 213	17.27	16.23	14.13	87.06	202.6	3,499	9.87
Co. 281	17.43	17.46	15.39	88.14	222.0	3,869	9.01
Co. 290	26.85	17.48	14.85	84.95	222.9	5,985	8.97
C. P. 807	24.58	16.63	14.38	86.47	201.3	4,948	9.94
C. P. 28/19	20.84	19.29	17.36	89.99	247.9	5,166	8.07
Difference for P=0.05	1.89				6.0	389	
Difference for P=0.01	2.53				8.0	519	

ON YAZOO VERY FINE SANDY LOAM, GODCHAUX PLANTATION, RACELAND (HARVESTED NOV. 22)

P. O. J. 36–M	11.36	15.77	13.10	83.07	183.3	2,082	10.91
P. O. J. 213	9.06	14.60	11.86	81.23	163.9	1,485	12.20
Co. 281	16.70	17.14	14.69	85.71	208.9	3,489	9.57
Co. 290	27.39	17.21	14.36	83.44	213.5	5,848	9.37
C. P. 807	21.14	16.51	14.18	85.89	197.9	4,184	10.11
C. P. 28/19	19.33	19.08	16.80	88.05	237.4	4,589	8.42
Difference for P=0.05	1.97				8.6	412	
Difference for P=0.01	2.64				11.5	550	

ON PHARR SILT LOAM, OAKLAWN PLANTATION, FRANKLIN (HARVESTED NOV. 7)

P. O. J. 36–M	7.40	16.74	13.71	81.90	190.4	1,409	10.50
P. O. J. 213	8.22	16.11	13.45	83.49	188.7	1,551	10.60
Co. 281	12.86	18.15	15.57	85.79	221.6	2,850	9.03
Co. 290	23.80	17.70	14.38	81.24	210.7	5,015	9.49
C. P. 807	20.10	16.59	13.65	82.28	186.2	3,743	10.74
C. P. 28/19	16.82	19.72	17.21	87.27	242.1	4,072	8.26
Difference for P=0.05	1.55				7.3	314	
Difference for P=0.01	2.07				9.8	420	

ON IBERIA SILT LOAM, ALBANIA PLANTATION, JEANERETTE (HARVESTED NOV. 13)

P. O. J. 36–M	11.32	16.66	14.35	86.13	204.6	2,316	9.78
P. O. J. 213	11.63	15.77	13.65	86.56	195.1	2,269	10.25
Co. 281	13.35	18.31	16.27	88.86	235.6	3,145	8.49
Co. 290	22.71	18.08	15.70	86.84	238.3	5,412	8.39
C. P. 807	22.56	16.27	14.01	86.11	195.7	4,415	10.22
C. P. 28/19	18.42	19.90	17.97	90.30	257.0	4,734	7.78
Difference for P=0.05	3.09				12.1	720	
Difference for P=0.01	4.27				16.8	996	

[1] Juice from individual samples composited for analysis and significance of observed varietal differences, therefore, not measurable.

TABLE 3.—*Results of first-stubble variety tests on light soil in Louisiana during 1934*—Continued

ON VERMILION SILT LOAM, CALDWELL PLANTATION, ERATH (HARVESTED NOV. 15)

Variety	Average acre yield of cane	Laboratory-mill juice analyses at harvest			Indicated available 96° sugar at harvest		Cane for 1 ton of sugar
		Brix	Sucrose	Purity	Per ton of cane	Per acre	
	Tons		*Percent*		*Pounds*	*Pounds*	*Tons*
P. O. J. 36-M	7.00	16.89	13.88	82.18	193.1	1,352	10.36
P. O. J. 213	11.14	17.34	15.04	86.74	215.2	2,397	9.29
Co. 281	13.10	18.69	16.47	88.12	237.5	3,111	8.42
Co. 290	22.80	18.74	15.69	83.72	233.7	5,328	8.56
C. P. 807	24.40	17.12	14.24	83.18	195.4	4,768	10.24
C. P. 28/19	16.76	20.78	18.60	89.51	264.9	4,440	7.55
Difference for P=0.05	4.17				11.0	1,026	
Difference for P=0.01	5.69				15.0	1,400	

ON YAZOO VERY FINE SANDY LOAM, ALMA PLANTATION, LAKELAND (HARVESTED NOV. 5)

P. O. J. 36-M	18.84	17.59	14.57	82.83	203.5	3,834	9.83
P. O. J. 213	20.75	16.84	14.20	84.32	200.3	4,156	9.98
Co. 281	20.48	17.82	15.06	84.51	212.6	4,354	9.41
Co. 290	32.68	16.31	12.87	78.91	185.5	6,062	10.78
C. P. 807	30.71	15.55	12.50	80.39	168.3	5,168	11.88
C. P. 28/19	24.22	18.93	16.05	84.79	222.5	5,389	8.99
Difference for P=0.05	2.26				5.6	431	
Difference for P=0.01	3.01				7.5	476	

TABLE 4.—*Results of second-stubble variety tests on light soil in Louisiana during 1934*

TESTS ON YAZOO VERY FINE SANDY LOAM, UNITED STATES SUGAR PLANT FIELD STATION, HOUMA (HARVESTED OCT. 30)

Variety [1]	Average acre yield of cane	Laboratory-mill juice analyses at harvest			Indicated available 96° sugar at harvest		Cane for 1 ton of sugar
		Brix	Sucrose	Purity	Per ton of cane	Per acre	
	Tons		*Percent*		*Pounds*	*Pounds*	*Tons*
P. O. J. 36-M	21.06	15.39	12.31	79.99	168.7	3,553	11.86
P. O. J. 213	19.14	15.58	12.66	81.26	175.0	3,349	11.43
P. O. J. 234	14.40	16.60	13.91	83.80	195.5	2,815	10.23
Co. 281	24.01	16.46	13.40	81.41	185.4	4,451	10.79
Co. 290	35.41	15.73	12.31	78.26	176.5	6,250	11.33
C. P. 807	33.22	15.01	12.13	80.81	163.8	5,441	12.21
Difference for P=0.05	1.95				9.1	172.6	
Difference for P=0.01	2.61				12.1	230.5	

TESTS ON YAZOO VERY FINE SANDY LOAM, GREENWOOD PLANTATION, THIBODAUX (HARVESTED OCT. 31)

P. O. J. 36-M	9.74	15.87	12.95	81.60	179.4	1,747	11.15
P. O. J. 213	13.70	16.12	13.29	82.44	185.2	2,537	10.80
P. O. J. 234	8.17	16.87	14.21	84.23	200.3	1,636	9.98
Co. 281	15.12	16.80	14.06	83.69	197.5	2,986	10.13
Co. 290	29.70	16.40	13.08	79.96	189.7	5,634	10.54
C. P. 807	17.62	15.85	12.97	81.83	176.4	3,108	11.34
Difference for P=0.05	1.79				8.70	364	
Difference for P=0.01	2.39				11.60	486	

[1] The varieties P. O. J. 36-M, P. O. J. 213, and P. O. J. 234 made complete growth failures.

TABLE 4.—*Results of second-stubble variety tests on light soil in Louisiana during 1934*—Continued

TESTS ON YAZOO VERY FINE SANDY LOAM, GODCHAUX PLANTATION, RACELAND (HARVESTED OCT. 24)

Variety	Average acre yield of cane	Laboratory-mill juice analyses at harvest			Indicated available 96° sugar at harvest		Cane for 1 ton of sugar
		Brix	Sucrose	Purity	Per ton of cane	Per acre	
	Tons		*Percent*		*Pounds*	*Pounds*	*Tons*
P. O. J. 36-M	19.57	14.63	11.34	77.51	152.6	2,986	13.11
P. O. J. 213	17.06	14.92	12.09	81.03	166.9	2,847	11.98
P. O. J. 234	13.03	15.65	12.71	81.21	175.7	2,289	11.38
Co. 281	19.21	15.79	12.93	81.89	179.5	3,448	11.14
Co. 290	37.29	15.77	12.80	81.17	187.5	6,992	10.67
C. P. 807	34.55	15.61	12.81	82.06	174.5	6,029	11.46
Difference for P=0.05	2.62				5.7	449	
Difference for P=0.01	3.50				10.1	600	

TESTS ON PHARR SILT LOAM, OAKLAWN PLANTATION, FRANKLIN (HARVESTED OCT. 19)[1]

Co. 281	4.22	16.33	13.27	81.26	183.5	774	10.90
Co. 290	12.84	16.23	13.04	80.34	189.9	2,438	10.53
C. P. 807	14.00	15.69	12.76	81.33	173.0	2,422	11.56
Difference for P=0.05	1.60				[2]		
Difference for P=0.01	2.17				[2]		

TESTS ON IBERIA SILT LOAM, ALBANIA PLANTATION, JEANERETTE (HARVESTED OCT. 26)

P. O. J. 36-M	2.81	14.23	10.86	79.59	144.7	407	13.82
P. O. J. 213	8.21	15.71	13.29	84.60	187.8	1,542	10.65
P. O. J. 234	5.53	16.85	14.45	85.28	205.6	1,137	9.73
Co. 281	11.42	16.59	13.93	83.97	196.0	2,238	10.20
Co. 290	29.60	17.63	14.31	81.17	209.6	6,204	9.54
C. P. 807	30.74	16.17	13.23	81.77	179.9	5,530	11.12
Difference for P=0.05	3.61				15.1	672	
Difference for P=0.01	4.92				20.6	916	

TESTS ON YAZOO VERY FINE SANDY LOAM, ALMA PLANTATION, LAKELAND (HARVESTED OCT. 29)

P. O. J. 36-M	7.26	16.47	13.69	83.12	191.6	1,391	10.44
P. O. J. 213	9.80	16.16	13.38	82.80	186.9	1,832	10.70
P. O. J. 234	2.36	16.91	13.93	82.38	194.0	458	10.31
Co. 281	11.78	17.19	14.55	84.64	205.6	2,422	9.73
Co. 290	30.70	15.99	12.71	79.49	183.9	5,646	10.88
C. P. 807	26.02	14.74	11.86	80.46	159.8	4,158	12.52
Difference for P=0.05	2.82				7.2	461	
Difference for P=0.01	3.77				9.6	616	

[2] Juice from individual samples composited for analysis and significance of observed varietal differences, therefore, not measurable.

TABLE 5.—*Results of preliminary tests with two new varieties at several localities in Louisiana during the 1933–34 crop year*

YIELD OF CANE PER ACRE (TONS)

Variety	Test station							
	Houma	Greenwood	Raceland	Oaklawn	Albania	Erath	Alma	Average of all tests
C. P. 29/320	36.48	22.72	21.86	17.81	28.39	22.48	24.96	24.96
C. P. 29/291	33.18	26.44	19.95	15.64	23.32	26.63	29.11	24.90
Co. 281	28.91	22.16	20.27	16.27	24.10	19.67	19.50	21.55

TABLE 5.—*Results of preliminary tests with two new varieties at several localities in Louisiana during the 1933–34 crop year*—Continued

INDICATED YIELD OF SUGAR PER TON OF CANE (POUNDS)

Variety	Test station							
	Houma	Greenwood	Raceland	Oaklawn	Albania	Erath	Alma	Average of all tests
C. P. 29/320	180.2	198.7	175.5	234.7	235.0	220.0	204.5	[1] 205.0
C. P. 29/291	160.2	202.0	163.5	220.9	209.2	205.7	177.8	[1] 188.8
Co. 281	178.9	207.2	172.6	226.7	219.2	222.1	185.4	[1] 200.3
INDICATED YIELD OF SUGAR PER ACRE (POUNDS)								
C. P. 29/320	6,574	4,514	3,836	4,180	6,672	4,946	5,104	5,118
C. P. 29/291	5,315	5,341	3,262	3,455	4,879	5,478	5,176	4,701
Co. 281	5,172	4,592	3,499	3,688	5,283	4,369	3,615	4,317

[1] Weighted average.

It is plainly indicated by these results that the varieties P. O. J. 36–M, P. O. J. 213, and P. O. J. 234 cannot compete in productivity with other varieties now available for cultivation. The variety Co. 290 rather consistently proved the highest yielding one in the group with regard to cane and sugar production per acre, the latter ranging from approximately double the corresponding yield obtained with the above-mentioned P. O. J. varieties in plant-cane tests to three times the yield obtained from them in second-stubble tests. In yield of sugar per ton of cane Co. 290 was not generally among the highest, but rather consistently proved superior to both P. O. J. 213 and P. O. J. 36–M. In a plant-cane variety test on Rosewood Plantation, near the northern edge of the sugarcane district, Co. 290 proved very immature on December 12, indicating that its late maturing qualities may possibly preclude its extensive cultivation in that section and others of similarly restricted growing season.

Yields of cane and sugar per ton and per acre obtained from C. P. 807 were, with but few exceptions, significantly below corresponding yields from Co. 290. The average difference in yields of sugar per acre consistently approximated 1,000 pounds in the average of plant-cane, first-stubble, and second-stubble tests.

Co. 281 usually averaged from 10 to 15 pounds of sugar per ton of cane in excess of the corresponding yield from Co. 290, but its yield of sugar per acre was consistently and significantly below that obtained with Co. 290, the observed differences ranging from approximately 1,700 pounds in the average of plant-cane and first-stubble tests to over 3,000 in the average of six second-stubble tests.

The results obtained with C. P. 28/19 are in agreement with ones previously obtained and reported. The yield of sugar per acre obtained from this variety slightly exceeded the corresponding yield observed with C. P. 807 in the average of both plant-cane and first-stubble tests, but the difference was not consistently maintained in individual trials. In the 9 plant-cane tests, C. P. 28/19 outyielded P. O. J. 234 by an average difference of more than 25 pounds in sugar per ton of cane. In each of 9 plant-cane and 6 first-stubble tests this variety proved definitely the highest of any in yield of sugar per ton of cane.

In line with preliminary appraisals made during previous years, C. P. 28/11 proved definitely inferior to C. P. 28/19 with respect to yield of sugar per ton of cane and per acre. This trend was very definitely maintained in each of 9 plant-cane tests, observed differences being in most cases very definitely significant. In 6 of the plant-cane tests and in the average of all of them C. P. 28/11 gave results on the whole less satisfactory than those obtained with Co. 281.

In order to facilitate varietal comparisons, particularly with regard to relative adaptability under different soil conditions, the cane-and sugar-yield data given in tables 2, 3, and 4 are presented in tables 6, 7, and 8 in terms of percentage of average group yield for each test. It will be noted that, while yield levels varied considerably from place to place, each variety tended to maintain in individual tests a more or less uniform relationship to the group average. There were, however, in certain instances, rather sharp and significant departures from the general trend. Of special significance in this connection is the relatively good showing made by the early maturing varieties C. P. 28/19 and P. O. J. 234 on Rosewood Plantation under previously mentioned unfavorable ripening conditions and the drop in relative sugar yield observed with the late maturing variety Co. 290.

TABLE 6.—*Relative yields of cane and indicated available sugar observed in plant-cane tests on light soil (table 2)*

[Group average=100]

Variety	Percentage of average group yield									
	Houma	Green-wood	Race-land	Oak-lawn	L. J. Landry	Alba-nia	Erath	Alma	Rose-wood	9 sta-tions
YIELD OF CANE PER ACRE										
Co. 290	135.0	132.0	147.7	134.1	143.3	141.2	140.5	132.6	131.3	136.9
C. P. 807	115.2	121.7	127.6	121.8	103.9	120.6	127.9	113.0	116.2	118.2
C. P. 28/19	103.5	96.9	102.7	97.4	108.4	90.0	102.1	90.4	95.0	98.2
Co. 281	94.3	90.7	92.4	88.7	89.9	93.8	88.8	76.2	78.2	87.5
C. P. 28/11	80.2	80.5	79.7	80.7	92.4	77.6	71.3	101.7	90.5	84.7
P. O. J. 234	71.8	78.3	49.9	77.2	62.2	76.8	69.4	85.9	88.7	74.6
Difference for P=0.05 [1]	6.6	8.6	9.4	8.5	13.6	8.2	12.6	7.8	14.8	8.7
Difference for P=0.01	8.9	11.5	12.5	11.3	18.5	11.0	17.2	10.4	22.5	11.7
INDICATED YIELD OF SUGAR PER TON OF CANE										
C. P. 28/19	109.9	115.3	111.3	110.1	110.8	108.5	107.5	113.1	119.1	111.5
Co. 281	103.1	100.1	103.2	99.8	104.3	100.7	102.3	99.1	105.2	101.9
C. P. 28/11	104.4	103.3	102.5	97.3	108.5	104.2	102.9	91.6	91.1	100.9
P. O. J. 234	92.9	99.9	85.3	103.4	91.2	99.0	100.9	103.7	111.4	98.5
Co. 290	100.7	94.4	105.3	99.0	95.8	97.7	96.5	93.4	83.8	96.5
C. P. 807	89.0	86.8	92.4	90.4	89.3	89.8	89.8	99.1	89.4	90.6
Difference for P=0.05 [1]	-------	3.1	4.3	2.6	5.4	-------	6.7	3.0	-------	4.9
Difference for P=0.01	-------	4.1	5.8	3.5	7.4	-------	9.2	4.1	-------	6.6
INDICATED YIELD OF SUGAR PER ACRE										
Co. 290	136.1	125.9	153.6	133.4	137.1	139.0	136.8	125.0	111.8	132.1
C. P. 28/19	113.8	112.9	112.9	107.7	119.9	98.4	110.8	103.2	114.9	110.5
C. P. 807	102.5	106.6	116.5	110.7	92.6	109.2	115.9	113.0	105.6	107.8
Co. 281	97.2	91.7	94.2	89.0	93.6	95.2	91.6	76.2	83.5	90.0
C. P. 28/11	83.8	84.0	80.7	78.9	100.2	81.5	74.0	94.1	83.8	84.8
P. O. J. 234	66.7	79.0	42.0	80.3	56.6	76.6	70.7	88.4	100.4	74.6
Difference for P=0.05 [1]	-------	10.6	10.2	9.0	15.2	-------	11.8	8.7	-------	9.9
Difference for P=0.01	-------	14.2	13.6	12.0	20.7	-------	16.0	11.7	-------	13.2

[1] Values based on corresponding differences shown in table 2.

TABLE 7.—*Relative yields of cane and indicated available sugar observed in first-stubble tests on light soil (table 3)*

[Group average=100]

YIELD OF CANE PER ACRE

Variety	Percentage of average group yield							
	Houma	Greenwood	Raceland	Oaklawn	Albania	Erath	Alma	Average of 7 tests
Co. 290	135.7	131.6	156.5	160.1	136.3	143.7	132.8	140.7
C. P. 807	113.0	120.5	120.8	135.2	135.4	153.8	124.8	126.7
C. P. 28/19	102.5	102.2	110.5	113.1	110.5	105.6	98.4	105.1
Co. 281	95.5	85.4	95.4	86.5	80.1	82.6	83.2	87.6
P. O. J. 213	70.7	84.7	51.8	55.3	69.8	70.2	84.3	71.0
P. O. J. 36-M	82.6	75.6	64.9	49.8	67.9	44.1	76.5	68.8
Difference for P=0.05 [1]	5.9	9.3	11.3	10.4	18.5	26.3	9.2	9.5
Difference for P=0.01	7.9	12.4	15.1	13.9	25.6	35.9	12.2	12.7

INDICATED YIELD OF SUGAR PER TON OF CANE

C. P. 28/19	117.7	114.2	118.2	117.2	116.3	118.6	111.9	116.3
Co. 281	102.8	102.3	104.0	107.3	106.6	106.4	106.9	105.2
Co. 290	94.3	102.7	106.3	102.0	107.8	104.7	93.3	101.8
P. O. J. 213	102.7	93.3	81.6	91.3	88.3	96.4	100.8	93.4
P. O. J. 36-M	91.2	94.8	91.3	92.2	92.6	86.5	102.4	92.9
C. P. 807	91.4	92.7	98.5	90.1	88.5	87.5	84.7	90.4
Difference for P=0.05 [1]	-------	2.8	4.3	3.5	5.5	4.9	2.8	5.7
Difference for P=0.01	-------	3.7	5.7	4.7	7.6	6.7	3.8	7.7

INDICATED YIELD OF SUGAR PER ACRE

Co. 290	128.3	134.8	161.9	161.4	145.7	145.8	125.6	140.8
C. P. 28/19	121.0	116.3	127.0	131.1	127.4	136.0	111.7	123.2
C. P. 807	103.7	111.4	115.8	120.5	118.9	130.5	107.1	113.9
Co. 281	98.5	87.1	96.6	91.7	84.7	85.1	90.2	91.1
P. O. J. 213	72.9	78.8	41.1	49.9	61.1	65.6	86.1	67.2
P. O. J. 36-M	75.5	71.5	57.6	45.4	62.3	37.0	79.4	63.8
Difference for P=0.05 [1]	-------	8.8	11.4	10.1	19.4	28.1	8.9	9.7
Difference for P=0.01	-------	11.7	15.2	13.5	26.8	38.3	11.9	13.0

[1] Values based on corresponding differences shown in table 3.

TABLE 8.—*Relative yields of cane and indicated available sugar in second-stubble tests on light soil (table 4)*

[Group average=100]

YIELD OF CANE PER ACRE

Variety	Percentage of average group yield						
	Raceland	Greenwood	Alma	Albania	Oaklawn	Houma	Average of all tests
Co. 290	158.9	189.5	209.5	201.1	248.1	144.3	178.8
C. P. 807	147.3	112.4	177.6	208.9	270.4	135.4	159.0
Co. 281	81.9	96.5	80.4	77.6	81.5	97.8	87.3
P. O. J. 213	72.7	87.4	66.9	55.8	[1] 0	78.0	69.2
P. O. J. 36-M	83.4	62.1	49.5	19.1	0	85.8	61.5
P. O. J. 234	55.6	52.1	16.1	37.6	0	58.7	44.3
Difference for P=0.05 [2]	11.2	11.4	19.2	24.5	30.9	7.9	23.4
Difference for P=0.01	14.9	15.2	25.7	33.4	41.9	10.6	31.6

[1] Complete growth failure.
[2] Values based on corresponding differences shown in table 4.

TABLE 8—*Relative yields of cane and indicated available sugar in second-stubble tests on light soil (table 4)*—Continued

[Group average=100]

INDICATED YIELD OF SUGAR PER TON OF CANE

Variety	Percentage of average group yield						
	Raceland	Greenwood	Alma	Albania	Oaklawn	Houma	Average of all tests
P. O. J. 234	101.7	106.5	103.7	109.8	[3]	109.4	106.4
Co. 281	103.9	105.1	110.0	104.7		103.3	104.7
Co. 290	108.5	100.9	98.4	111.9		98.0	103.7
P. O. J. 213	96.6	98.5	100.0	100.3		98.0	98.8
C. P. 807	101.0	93.8	85.5	96.1		93.7	94.1
P. O. J. 36-M	88.3	95.4	102.5	77.3		97.6	92.3
Difference for P=0.05 [2]	3.3	4.6	3.8	8.1		5.0	8.2
Difference for P=0.01	5.9	6.2	5.1	11.0		6.7	11.2

INDICATED YIELD OF SUGAR PER ACRE

Co. 290	170.6	191.6	213.0	218.2	259.6	142.8	185.8
C. P. 807	147.1	105.7	156.8	194.5	257.9	128.2	150.4
Co. 281	84.1	101.5	91.4	78.7	82.4	102.2	91.5
P. O. J. 213	69.5	86.3	69.1	54.2	0	77.2	68.0
P. O. J. 36-M	72.9	59.4	52.5	14.3	0	84.7	57.3
P. O. J. 234	55.9	55.6	17.3	40.0	0	64.9	46.8
Difference for P=0.05 [2]	11.0	12.4	17.4	23.6		3.9	27.8
Difference for P=0.01	14.6	16.5	23.2	32.2		5.3	37.9

[2] Values based on corresponding differences shown in table 4.
[3] Comparisons not available because of failure of P. O. J. varieties.

The field on which plant-cane and first-stubble tests were conducted at Raceland (tables 2 and 3), showed a very high borer infestation, the results of which are plainly indicated by the reduced relative yields from the borer-susceptible varieties P. O. J. 213 and P. O. J. 234.

The relative performance of Co. 281 has been rather uniform, particularly in plant-cane tests. There was, however, a rather pronounced drop in its relative yields obtained in tests on Rosewood and Alma Plantations.

The superior stubbling qualities of Co. 290, as well as those of C. P. 807, to P. O. J. 213, P. O. J. 234, and P. O. J. 36–M are shown by the high relative yields of cane and sugar per acre obtained in second-stubble tests (table 8).

Figure 2 shows graphically relative yields of sugar per acre observed with different varieties in plant-cane tests on light soil at each of the nine test stations. Houma, Raceland, and Greenwood are near the southern extremity of the sugarcane district, while Alma and Rosewood are near the opposite border. Other stations are at intermediate localities near the western border.

The previously mentioned differences in relative adaptability between the early maturing varieties C. P. 28/19 and P. O. J. 234 and the late maturing Co. 290 and Co. 281 stand out conspicuously in this illustration. Another interesting relationship is shown by a comparison of results obtained at Raceland and Rosewood. The test at Raceland was conducted on relatively infertile soil as indicated by observed yields of cane, and, in addition, there was a very heavy borer infestation as well as the usual prevalence of mosaic. At Rosewood the test was conducted under conditions of excessive fertility.

The cane suffered comparatively little damage from borers, and susceptible varieties showed a very low percentage of mosaic infection. At Raceland average varietal results proved highly variable while at Rosewood much more uniform results were obtained, which emphasizes the common observation that many inherent varietal weaknesses may be partly or wholly masked under favorable growing conditions. On the other hand, results of tests conducted under extremely unfavorable conditions may reflect in undue proportion advantages resulting from varietal vigor.

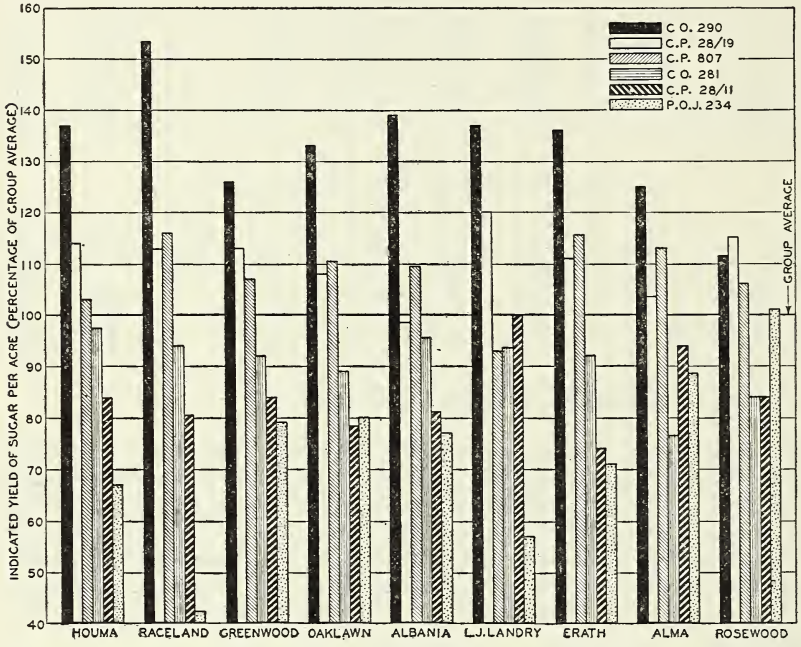

FIGURE 2.—Relative yields of sugar per acre observed with important varieties of sugarcane in nine plantation trials in Louisiana during 1934 (table 6).

PRELIMINARY TESTS WITH NEW VARIETIES

The two recently bred varieties, C. P. 29/291 and C. P. 29/320, were included in preliminary tests with Co. 281 at seven localities, results of which are given in table 5. In the average of all tests the former varieties proved superior to Co. 281 in yield of sugar per acre, with the advantage in favor of C. P. 29/320. C. P. 29/291 showed average yields of sugar per ton of cane lower than corresponding yields from Co. 281, while C. P. 29/320 proved slightly higher than Co. 281 in this respect. The differences in yields of sugar per ton of cane and per acre between Co. 281 and C. P. 29/320 were not as great, however, as corresponding differences between the former variety and C. P. 28/19 in extensive plant-cane tests simultaneously conducted. C. P. 29/320 and particularly C. P. 29/291 are susceptible to mosaic and, as pointed out by Summers and Rands (*9*), since these two varieties have not been in cultivation in Louisiana a sufficient length of time to permit the spread of the disease within the varieties

to a degree which may be regarded as representative, it is quite possible that the results of future tests may differ widely from the ones above reported. As determined by Abbott (*1*) in laboratory tests and as conclusively shown by instances of severe damage observed by the same investigator in field plantings during the spring of 1935,[2] C. P. 29/320 is also susceptible to red rot.

EARLY MATURING VARIETIES

The recently released varieties C. P. 28/11 and 28/19 and the less extensively tested variety C. P. 29/320 have attracted much attention by reason of their relatively early maturing qualities. The data given in table 9 based on periodic juice analyses between September 5 and December 13, 1934, afford additional evidence of their superior qualities in this respect. Corroborating the results of previous tests, these three varieties showed yields of sugar per ton of cane quite generally higher than corresponding yields from P. O. J. 234 at all dates, with the advantage very definitely in favor of C. P. 28/19.

As previously mentioned in this report, the abrupt check in the progress of maturity after November 15 followed a minimum temperature of 31° F. recorded at Houma on November 13.

TABLE 9.—*Indicated available sugar per ton of cane at different dates observed with four early maturing varieties at Houma during 1934*

Date of juice analysis	Indicated yield of 96° sugar per ton of cane							
	Plant cane				First stubble			
	P. O. J. 234	C. P. 28/19	C. P. 28/11	C. P. 29/320	P. O. J. 234	C. P. 28/19	C. P. 28/11	C. P. 29/320
	Pounds	*Pounds*	*Pounds*	*Pounds*	*Pounds*	*Pounds*	*Pounds*	*Pounds*
Sept. 5	54.1	67.8	65.5	70.5	58.1	92.2	84.1	98.1
Sept. 25	120.4	116.1	109.6	117.9	116.3	162.8	135.5	136.6
Oct. 15	148.5	165.1	155.8	155.2	156.4	200.1	190.6	173.3
Nov. 1	174.2	195.3	183.9	182.3	181.7	224.0	206.2	196.5
Nov. 15	184.0	218.2	203.1	195.6	210.4	236.9	214.6	214.9
Nov. 30	196.0	217.8	204.2	200.8	212.2	232.7	230.8	222.3
Dec. 13	188.8	222.6	206.4	198.9	211.6	233.4	212.2	217.1

FIBER STUDIES

The results of fiber determinations made on plant and first-stubble cane of important varieties from several localities at which variety tests were conducted are summarized in table 10. Fiber analyses were made in connection with experimental milling tests such as reported in a previous publication (*3*). In spite of rather wide variations in the level of fiber content of cane from different localities and the usual variation between plant cane and first stubble, varietal characteristics as to relative fiber content were very consistently maintained in individual tests. Co. 290 proved to be definitely the lowest in percentage of fiber in every instance, averaging 11.16 percent in plant-cane tests, and 11.39 percent in those on first stubble. In the average of plant cane and first stubble, and quite generally in individual instances, its percentage of fiber approximated 85 percent

[2] Unpublished notes.

of the corresponding value for Co. 281. C. P. 807, C. P. 28/11, and C. P. 28/19 showed in every case the three highest fiber percentages of the group, the latter two in most instances showing fiber contents somewhat higher than observed with C. P. 807. The following averages were observed in plant-cane tests: C. P. 807, 14.93 percent; C. P. 28/11, 15.14 percent; C. P. 28/19, 15.44 percent; and the following in first-stubble tests: C. P. 807, 15.82 percent; C. P. 28/19, 16.01 percent. These ranged much higher than corresponding values for Co. 281, which averaged 13.08 percent in plant-cane tests and 13.82 percent in first-stubble tests.

TABLE 10.—*Summary of fiber determinations on important varieties of sugarcane in connection with milling tests conducted at Houma during 1934*

PLANT-CANE TESTS

Variety	Fiber content of cane in tests at—								
	Albania	Alma	Erath	Greenwood	Houma	L. J. Landry	Oaklawn	Raceland	Average
	Percent	*Percent*	*Percent*	*Percent*	*Percent*	*Percent*	*Percent*	*Percent*	*Percent*
Co. 281	13.34	11.49	13.35	13.33	12.53	14.07	13.43	----	13.08
Co. 290	11.02	10.05	11.19	10.94	10.83	11.06	13.02	----	11.16
C. P. 807	15.50	13.25	15.35	15.13	14.42	15.19	15.67	----	14.93
C. P. 28/11	15.10	12.95	15.14	15.66	14.90	16.79	15.44	----	15.14
C. P. 28/19	15.19	13.68	15.20	16.25	14.66	16.29	16.82	----	15.44
C. P. 29/320	14.48	12.41	13.49	13.89	13.09	14.21	16.35	----	13.99
Average	14.10	12.30	13.95	14.20	13.40	14.60	15.12	----	13.96
FIRST-STUBBLE TESTS									
Co. 281	14.61	12.27	14.51	13.88	12.48	----	14.42	14.54	13.82
Co. 290	12.30	10.43	11.66	11.44	10.51	----	11.96	11.41	11.39
C. P. 807	17.34	14.41	16.24	16.07	13.77	----	17.11	15.80	15.82
C. P. 28/19	17.35	14.41	17.10	16.11	14.93	----	16.12	16.05	16.01
Average	15.40	12.88	14.88	14.37	12.92	----	14.90	14.45	14.26

The relative fiber content of C. P. 29/320 proved more variable than was the case with any other variety, which naturally detracts from the significance of observed average values. In seven plant-cane tests it averaged approximately 7 percent above the corresponding value for Co. 281.

The fiber content of the different varieties studied proved consistently lower on Alma Plantation than observed in connection with any other test on light soil. This was probably due in part to the shorter growing season at that locality, and also possibly to the high level of soil fertility as reflected by the comparatively high yields of cane obtained in the tests.

TESTS ON HEAVY CLAY SOILS

The results of variety tests on heavy clay soils summarized in tables 11, 12, 13, and 14 are in good agreement with results previously reported. Co. 290 and C. P. 807 have continued to produce under such conditions economic yields from plant cane and first stubble, and, on the better types of such soils, from second stubble. With but few exceptions, Co. 290 has significantly outyielded C. P. 807 in available sugar per acre. In the average of plant-cane and

first-stubble tests (tables 11 and 12) the difference in favor of Co. 290 approximated 1,000 pounds of 96° sugar, while in second- and third-stubble tests (tables 13 and 14) it was over 500 pounds. The extreme vigor and superior stubbling qualities of these two varieties are indicated by the very satisfactory results obtained under conditions where the P. O. J. varieties gave results ranging from highly unsatisfactory to complete growth failure. That there is, however, a very definite limit to tolerance of these two varieties to conditions unfavorable to growth is clearly indicated by results obtained in first-stubble tests on Alma Plantation where Co. 290 yielded at the rate of approximately 12 tons and C. P. 807 at the rate of but slightly over 6 tons of cane per acre.

TABLE 11.—*Results of plant-cane variety tests on heavy clay soil in Louisiana during 1934*

Variety	Average acre yield of cane	Laboratory mill-juice analyses at harvest			Indicated available 96° sugar at harvest		Cane for 1 ton of sugar
		Brix	Sucrose	Purity	Per ton of cane	Per acre	
	Tons		*Percent*		*Pounds*	*Pounds*	*Tons*
ON SHARKEY CLAY, UNITED STATES SUGAR PLANT FIELD STATION, HOUMA (HARVESTED DEC. 14)							
Co. 281	19.84	16.75	14.08	84.06	198.3	3,934	10.09
Co. 290	31.23	16.50	13.31	80.67	194.2	6,065	10.30
C. P. 807	26.10	15.79	12.96	82.08	176.6	4,609	11.32
C. P. 28/19	23.26	18.33	15.73	85.82	219.4	5,103	9.12
Difference for P=0.05	2.47				[1]		
Difference for P=0.01	3.48				[1]		
ON SHARKEY CLAY, GODCHAUX PLANTATION, RACELAND (HARVESTED DEC. 18)							
Co. 281	24.83	14.28	11.30	79.13	153.9	3,821	13.00
Co. 290	34.08	14.26	10.71	75.11	149.8	5,105	13.35
C. P. 807	27.09	13.75	10.48	76.22	136.8	3,706	14.62
C. P. 28/19	21.71	15.99	12.80	80.05	172.0	3,734	11.63
Difference for P=0.05	2.59				10.0	619	
Difference for P=0.01	3.58				14.3	889	
ON BERWICK CLAY, OAKLAWN PLANTATION, FRANKLIN (HARVESTED DEC. 10)							
Co. 281	13.58	16.96	14.30	84.32	201.7	2,739	9.92
Co. 290	20.75	16.43	13.16	80.10	191.3	3,969	10.45
C. P. 807	21.16	15.98	13.26	82.98	181.7	3,845	11.01
C. P. 28/19	15.19	18.64	16.28	87.34	229.1	3,480	8.73
Difference for P=0.05	2.64				[1]		
Difference for P=0.01	3.65				[1]		
ON SHARKEY CLAY, ALMA PLANTATION, LAKELAND (HARVESTED DEC. 5)							
Co. 281	19.22	16.18	13.05	80.65	179.7	3,454	11.13
Co. 290	36.43	15.99	12.21	76.36	172.6	6,288	11.59
C. P. 807	28.05	16.27	13.35	82.05	181.8	5,099	11.00
C. P. 28/19	20.55	18.15	15.18	83.64	208.9	4,293	9.57
Difference for P=0.05	4.33				7.2	711	
Difference for P=0.01	5.98				9.9	983	

[1] Juice from individual samples composited for analysis and significance of observed varietal differences, therefore, not measurable.

TABLE 12.—*Results of first-stubble variety tests on heavy clay soil in Louisiana during 1934*

ON SHARKEY CLAY, UNITED STATES SUGAR PLANT FIELD STATION, HOUMA (HARVESTED NOV. 12)

Variety	Average acre yield of cane	Laboratory mill-juice analyses at harvest			Indicated available 96° sugar at harvest		Cane for 1 ton of sugar
		Brix	Sucrose	Purity	Per ton of cane	Per acre	
	Tons		*Percent*		*Pounds*	*Pounds*	*Tons*
P. O. J. 234	10.92	17.38	15.13	87.05	216.9	2,369	9.22
Co. 281	21.61	17.55	15.20	86.61	217.3	4,696	9.20
Co. 290	30.40	16.56	13.58	82.00	200.0	6,080	10.00
C. P. 807	27.47	15.76	13.24	84.01	182.6	5,016	10.95
C. P. 28/19	24.57	18.88	16.53	87.55	232.9	5,722	8.59
Difference for P=0.05	2.18				[1]		
Difference for P=0.01	3.05				[1]		

ON SHARKEY CLAY, GREENWOOD PLANTATION, THIBODAUX (HARVESTED NOV. 22)

P. O. J. 234	4.11	17.03	14.55	85.44	206.6	849	9.68
Co. 281	13.59	17.87	15.56	87.07	223.1	3,032	8.96
Co. 290	20.08	17.56	14.92	84.92	223.9	4,496	8.93
C. P. 807	14.50	16.06	13.64	84.93	189.2	2,743	10.57
Difference for P=0.05	3.35				7.3	682	
Difference for P=0.01	4.63				10.1	943	

ON SHARKEY CLAY, GODCHAUX PLANTATION, RACELAND (HARVESTED NOV. 23)

P. O. J. 234	5.13	17.27	14.90	86.28	212.6	1,091	9.41
Co. 281	15.82	18.08	15.85	87.67	228.0	3,607	8.77
Co. 290	23.25	17.62	15.08	85.58	227.2	5,282	8.80
C. P. 807	17.43	16.20	13.66	84.32	188.8	3,291	10.59
Difference for P=0.05	2.64				6.6	589	
Difference for P=0.01	3.65				9.2	815	

ON BERWICK CLAY, OAKLAWN PLANTATION, FRANKLIN (HARVESTED NOV. 8) [2]

Co. 281	12.21	17.56	15.00	85.42	213.0	2,601	9.39
Co. 290	17.82	17.19	14.32	83.30	212.7	3,790	9.40
C. P. 807	20.58	16.41	13.62	83.00	186.7	3,842	10.71
Difference for P=0.05	3.41				10.4	639	
Difference for P=0.01	4.73				14.4	886	

ON IBERIA SILTY CLAY LOAM, ALBANIA PLANTATION, JEANERETTE, (HARVESTED NOV. 14)

P. O. J. 234	4.14	18.04	16.25	90.08	236.9	981	8.44
Co. 281	10.72	18.58	16.92	91.07	247.9	2,657	8.07
Co. 290	18.33	18.47	16.23	87.87	247.8	4,542	8.07
C. P. 807	19.24	16.96	15.02	88.56	212.8	4,094	9.40
Difference for P=0.05	2.58				6.5	618	
Difference for P=0.01	3.89				9.9	937	

ON SHARKEY CLAY, ALMA PLANTATION, LAKELAND (HARVESTED NOV. 6) [2]

Co. 281	5.74	17.31	14.55	84.06	204.9	1,176	9.76
Co. 290	11.98	17.05	13.92	81.64	204.5	2,450	9.78
C. P. 807	6.04	15.32	11.90	77.68	157.1	949	12.73
Difference for P=0.05	3.56				8.6	702	
Difference for P=0.01	4.94				12.0	974	

[1] Juice from individual samples composited for analysis and significance of observed varietal differences, therefore not measurable.

[2] P. O. J. 234 made a complete growth failure.

TABLE 13.—*Results of second-stubble variety tests on heavy clay soil in Louisiana during 1934*

ON SHARKEY CLAY, GODCHAUX PLANTATION, RACELAND (HARVESTED OCT. 25)

Variety	Average acre yield of cane	Laboratory mill-juice analyses at harvest			Indicated available 96° sugar at harvest		Cane for 1 ton of sugar
		Brix	Sucrose	Purity	Per ton of cane	Per acre	
	Tons		*Percent*		*Pounds*	*Pounds*	*Tons*
P. O. J. 234	9.09	14.80	11.96	80.81	164.8	1,498	12.14
Co. 281	13.02	15.08	12.18	80.77	167.8	2,185	11.92
Co. 290	31.44	15.31	12.28	80.21	178.6	5,615	11.20
C. P. 807	28.72	15.19	12.61	82.91	172.8	4,963	11.57
Difference for P=0.05	6.69				12.70	1,133	
Difference for P=0.01	9.25				17.56	1,566	

ON SHARKEY CLAY, UNITED STATES SUGAR PLANT FIELD STATION, HOUMA (HARVESTED OCT. 25)

P. O. J. 36–M	11.83	14.54	11.17	76.82	149.5	1,769	13.38
P. O. J. 213	12.59	15.07	12.08	80.16	165.7	2,086	12.07
P. O. J. 234	4.19	16.03	12.91	80.54	177.6	744	11.26
Co. 281	22.48	15.96	12.83	80.39	176.3	3,963	11.34
Co. 290	33.89	15.51	12.05	77.69	172.1	5,832	11.62
C. P. 807	32.57	15.10	12.29	81.39	166.7	5,429	12.00
Difference for P=0.05	1.81						
Difference for P=0.01	2.42						

ON SHARKEY HEAVY SILT LOAM, UNITED STATES SUGAR PLANT FIELD STATION, HOUMA (HARVESTED OCT. 31)

P. O. J. 36–M	19.29	15.65	12.76	81.53	176.7	3,409	11.32
C. P. 28/11	26.67	17.69	14.58	82.42	199.1	5,310	10.05
C. P. 28/19	28.73	18.49	16.07	86.91	225.6	6,481	8.87
C. P. H. 153	20.93	16.68	13.04	78.18	176.3	3,690	11.34
Difference for P=0.05	3.08						
Difference for P=0.01	4.42						

TABLE 14.—*Results of third-stubble variety tests on Sharkey clay, United States Sugar Plant Field Station, Houma, harvested Oct. 23, 1934*

Variety	Average acre yield of cane	Laboratory mill-juice analyses at harvest			Indicated available 96° sugar at harvest		Cane for 1 ton of sugar
		Brix	Sucrose	Purity	Per ton of cane	Per acre	
	Tons		*Percent*		*Pounds*	*Pounds*	*Tons*
P. O. J. 36–M	0.67	13.39	10.01	74.80	131.7	88	15.19
P. O. J. 213	2.80	14.87	11.85	79.70	162.0	454	12.35
Co. 281	14.48	15.91	12.84	80.70	176.8	2,560	11.31
Co. 290	24.14	15.63	12.25	78.40	175.8	4,244	11.38
C. P. 807	20.85	15.43	12.57	81.50	170.5	3,555	11.73
P. O. J. 36	1.13	13.92	10.63	76.40	141.7	160	14.11
Difference for P=0.05	7.10						
Difference for P=0.01	9.49						

The results obtained with Co. 281 in these and previous tests indicate rather questionable adaptability. While under certain conditions, notably at Houma and Raceland, fairly good yields were obtained with the latter variety in plant-cane, first-stubble, and even second-stubble tests, it has definitely not proved satisfactory on the worst types of heavy clay soils.

C. P. 28/19 proved on the whole comparatively satisfactory on clay soils, with yields of sugar per acre approximating corresponding ones from C. P. 807 in the average of 4 plant-cane tests at different localities (table 11) and definitely surpassing that of the latter in 1 first-stubble test at Houma (table 12). The yield of sugar per ton of cane obtained with C. P. 28/19 exceeded that from C. P. 807 by differences ranging from approximately 40 pounds in the average of 4 plant-cane tests to approximately 50 pounds in 1 first-stubble test. The corresponding differences in favor of C. P. 28/19 in comparison with Co. 290 were slightly in excess of 30 pounds in each case. C. P. 28/19 gave very satisfactory yields in a second-stubble test on a plot ranging from heavy mixed to clay soil at the United States Sugar Plant Field Station at Houma (table 13).

Confirming previous observations, P. O. J. 234, P. O. J. 213, and P. O. J. 36–M gave results which were very definitely and consistently unsatisfactory.

TESTS ON MUCK SOILS

Since 1926 a great number of varieties have been tested in field trials on Clovelly Plantation near Cut Off to determine their adaptability to Louisiana muck soils. Conditions prevailing in this reclamation district, which was drained during 1915 and put in cultivation in 1916, are considered representative of the better types of Louisiana reclaimed marshlands. Plots on which tests were conducted consisted of clay subsoil overlain by a layer of muck averaging approximately 6 inches in depth, in which a relatively high percentage of clay particles had been incorporated as a result of previous cultivation operations.

Heretofore, with the doubtful possible exception of Co. 281, which has given variable results and often afforded cane of very low milling value, no variety has proved sufficiently satisfactory from a milling standpoint to justify its extensive substitution for the early maturing but otherwise highly unsatisfactory variety, D–95. The results of tests given in table 15 are therefore of extreme interest in that they indicate that the variety C. P. 28/19 may prove a valuable one under such conditions. Yields of sugar per acre obtained with the latter variety were in both cases greatly in excess of corresponding yields from D–95, while the yields of sugar per ton of cane of 186.5 and 176.7 pounds, respectively, in plant-cane and first-stubble tests are considered quite satisfactory. In a single test C. P. 28/11 showed yields of sugar per ton of cane and per acre significantly under corresponding ones from C. P. 28/19. Yields of cane obtained with Co. 281 were in all cases very satisfactory, but the yields of sugar per ton of cane were relatively low, particularly in plant-cane tests. In a single test C. P. 29/291 and C. P. 29/320 gave results definitely better than obtained with Co. 281, but relatively not as satisfactory as obtained with C. P. 28/19.

TABLE 15.—*Results of variety tests on muck soil, Clovelly Plantation, Cut Off, La., during 1934*

PLANT-CANE TESTS, VARIETY GROUP 1 (HARVESTED NOV. 26)

Variety	Average acre yield of cane	Laboratory mill-juice analyses at harvest			Indicated available 96° sugar at harvest		Cane for 1 ton of sugar
		Brix	Sucrose	Purity	Per ton of cane	Per acre	
	Tons		*Percent*		*Pounds*	*Pounds*	*Tons*
Co. 281	35.24	14.32	10.72	74.86	141.2	4,976	14.16
D–95	30.20	14.94	11.68	78.18	167.4	5,055	11.95
C. P. 28/11	30.14	15.72	11.78	74.94	152.1	4,584	13.15
C. P. 28/19	33.74	16.82	13.73	81.63	186.5	6,293	10.72
Difference for P=0.05	2.03				11.87	537	
Difference for P=0.01	3.08				17.98	814	

PLANT-CANE TESTS, VARIETY GROUP 2 (HARVESTED NOV. 26)

Co. 281	38.24	13.81	10.01	72.48	129.1	4,937	15.49
D–95	33.27	14.56	11.11	76.30	156.9	5,220	12.75
C. P. 29/291	42.47	14.67	10.68	72.80	138.1	5,865	14.48
C. P. 29/320	37.51	15.38	11.51	74.84	151.5	5,683	13.20
Difference for P=0.05	6.31				9.64	999	
Difference for P=0.01	9.56				14.61	1,513	

FIRST STUBBLE TESTS (HARVESTED NOV. 19)

Co. 281	34.89	15.46	11.88	76.84	159.0	5,548	12.58
D–95	25.32	17.15	14.41	84.02	215.0	5,444	9.30
C. P. 28/19	40.83	17.18	13.37	77.82	176.7	7,215	11.32
Difference for P=0.05	3.92						
Difference for P=0.01	9.03						

SUMMARY OF ANNUAL RESULTS

Since yields of cane and sugar to be obtained with any given variety are closely related to prevailing weather conditions, and since different varieties often respond differently to the same set of weather conditions, the relative results obtained with a group of varieties during a single year may not be entirely representative of what may be expected over a period of years. Therefore, the results of field trials extending over a period of several years may be regarded as much more significant than results obtained during any one year. Since 1926, the United States Department of Agriculture has conducted a great number of variety tests with sugarcane in Louisiana, the results of which have been given in yearly circulars (*4*). The annual average results obtained with the principal varieties tested are summarized in tables 16, 17, and 18.

TABLE 16.—*Average annual results of plant-cane variety tests on light soil in Louisiana during the period 1926–34*

YIELD OF CANE PER ACRE (TONS)

Variety	1926	1927	1928	1929	1930	1931	1932	1933	1934
P. O. J. 36	18.64	23.10	29.11	29.47	[1] 23.82	[1] 21.42			
P. O. J. 36–M		20.00	29.22	29.99	24.83	24.46	19.27	19.56	
P. O. J. 213	20.61	24.50	31.29	30.25	24.42	21.84	20.12	20.21	
P. O. J. 234	20.27	20.90	23.62	[1] 27.98	23.81	23.42	20.09	[1] 19.74	18.85
Co. 281			[1] 21.28	[1] 30.07	26.55	24.45	24.47	20.95	22.09
Co. 290						[1] 35.00	36.12	34.36	34.57
C. P. 807			[1] 42.76	[1] 41.23	32.97	34.97	31.43	28.51	29.85
C. P. 28/19								24.11	24.80

[1] This variety was not included in all tests conducted during the year, and the yield shown has been adjusted in the manner described in the text.

TABLE 16.—*Average annual results of plant-cane variety tests on light soil in Louisiana during the period 1926–34*—Continued

INDICATED YIELD OF 96° SUGAR PER TON OF CANE (POUNDS)

Variety	1926	1927	1928	1929	1930	1931	1932	1933	1934
P. O. J. 36	115.88	165.1	135.1	151.1	[1]155.4	[1]134.7			
P. O. J. 36–M		180.9	152.8	155.5	159.16	152.2	185.8	197.7	
P. O. J. 213	134.06	181.8	150.3	156.9	165.60	153.66	188.3	199.8	
P. O. J. 234	138.43	191.9	178.5	[1]174.7	187.48	164.56	212.0	[1]220.9	192.5
Co. 281			[1]150.7	[1]179.3	185.00	164.54	221.4	218.1	198.0
Co. 290						[1]158.5	196.0	205.8	185.8
C. P. 807			[1]143.7	[1]159.3	160.1	145.0	195.3	187.8	175.6
C. P. 28/19								232.1	216.6

INDICATED YIELD OF 96° SUGAR PER ACRE (POUNDS)

Variety	1926	1927	1928	1929	1930	1931	1932	1933	1934
P. O. J. 36	2,160	3,814	3,933	4,453	[1]3,702	[1]2,885			
P. O. J. 36–M		3,618	4,465	4,663	3,952	3,724	3,580	3,863	
P. O. J. 213	2,763	4,454	4,703	4,746	4,044	3,356	3,789	4,037	
P. O. J. 234	2,806	4,011	4,216	[1]4,888	4,464	3,854	4,259	[1]4,360	3,629
Co. 281			[1]3,207	[1]5,392	4,912	4,023	5,418	4,569	4,374
Co. 290						[1]5,546	7,080	7,073	6,424
C. P. 807			[1]6,144	[1]6,567	5,277	5,070	6,138	5,353	5,241
C. P. 28/19								5,597	5,372

[1] This variety was not included in all tests conducted during the year, and the yield shown has been adjusted in the manner described in the text.

TABLE 17.—*Average annual results of first-stubble variety tests on light soil in Louisiana during the period 1927–34*

YIELD OF CANE PER ACRE (TONS)

Variety	1927	1928	1929	1930	1931	1932	1933	1934
P. O. J. 36	24.77	27.59	29.57	25.63	[1]19.67			
P. O. J. 36–M		20.99	28.79	24.26	20.11	19.27	16.32	13.82
P. O. J. 213	23.53	28.68	31.62	26.37	18.45	19.43	17.74	14.26
P. O. J. 234	15.90	19.43	[1]26.25	[1]21.87	18.78	17.92	14.88	[1]10.87
Co. 281			[1]28.21	[1]26.31	19.01	23.10	19.61	17.61
Co. 290						[1]29.33	31.73	28.28
C. P. 807			[1]37.00	[1]37.79	29.72	30.83	30.24	25.47
C. P. 28/19								21.13

INDICATED YIELD OF 96° SUGAR PER TON OF CANE (POUNDS)

Variety	1927	1928	1929	1930	1931	1932	1933	1934
P. O. J. 36	169.68	125.0	163.8	153.77	[1]144.80			
P. O. J. 36–M		136.5	176.5	155.03	163.25	184.1	180.1	194.1
P. O. J. 213	190.23	130.1	172.2	166.44	162.82	193.1	186.8	198.4
P. O. J. 234	182.20	150.3	[1]202.4	[1]185.9	178.54	215.4	212.1	[1]202.3
Co. 281			[1]177.6	[1]156.4	172.07	206.4	205.4	217.6
Co. 290						[1]199.5	199.9	209.5
C. P. 807			[1]148.1	[1]160.0	157.4	185.4	172.8	188.1
C. P. 28/19								241.8

INDICATED YIELD OF 96° SUGAR PER ACRE (POUNDS)

Variety	1927	1928	1929	1930	1931	1932	1933	1934
P. O. J. 36	4,203	3,449	4,844	3,941	[1]2,848			
P. O. J. 36–M		2,865	5,081	3,761	3,283	3,548	2,939	2,682
P. O. J. 213	4,476	3,731	5,445	4,389	3,004	3,752	3,313	2,829
P. O. J. 234	2,897	2,920	[1]5,312	[1]4,066	3,353	3,860	3,157	[1]2,199
Co. 281			[1]5,011	[1]4,116	3,271	4,768	4,028	3,832
Co. 290						[1]5,851	6,344	5,925
C. P. 807			[1]5,481	[1]6,045	4,678	5,716	5,227	4,792
C. P. 28/19								5,109

[1] This variety was not included in all tests conducted during the year, and the yield shown has been adjusted in the manner described in the text.

TABLE 18.—*Average annual results of second-stubble variety tests on light soil in Louisiana during the period 1929–34*

YIELD OF CANE PER ACRE (TONS)

Variety	1929	1930	1931	1932	1933	1934
P. O. J. 36	15.34	22.01	[1] 23.85			
P. O. J. 36-M	15.14	21.04	22.83	15.39	14.46	10.07
P. O. J. 213	12.30	22.32	21.86	15.83	11.99	11.32
P. O. J. 234		[1] 14.93	[1] 15.93	14.67	7.16	7.25
Co. 281		[1] 23.64	[1] 22.45	18.24	16.48	14.29
Co. 290					[1] 34.63	29.26
C. P. 807		[1] 32.26	[1] 35.90	26.32	33.15	26.02

INDICATED YIELD OF 96° SUGAR PER TON OF CANE (POUNDS)

P. O. J. 36	161.0	120.6	[1] 141.6			
P. O. J. 36-M	157.2	129.7	140.2	186.9	159.5	169.3
P. O. J. 213	154.5	132.5	151.14	184.20	156.5	178.6
P. O. J. 234		[1] 150.8	[1] 164.9	208.5	182.5	192.1
Co. 281		[1] 124.0	[1] 156.1	199.8	173.1	190.6
Co. 290					[1] 177.8	188.9
C. P. 807		[1] 117.6	[1] 142.7	189.3	146.8	172.0

INDICATED YIELD OF 96° SUGAR PER ACRE (POUNDS)

P. O. J. 36	2,470	2,654	[1] 3,378			
P. O. J. 36-M	2,380	2,729	3,200	2,876	2,306	1,705
P. O. J. 213	1,900	2,957	3,304	2,916	1,876	2,022
P. O. J. 234		[1] 2,252	[1] 2,627	3,059	1,307	1,393
Co. 281		[1] 2,932	[1] 3,504	3,645	2,853	2,723
Co. 290					[1] 6,157	5,527
C. P. 807		[1] 3,795	[1] 5,124	4,982	4,868	4,475

[1] This variety was not included in all tests conducted during the year, and the yield shown has been adjusted in the manner described in the text.

One of the difficulties encountered in tabulating the above-mentioned results is the fact that in several instances a variety was not included in tests at all localities during a given year. This was usually due to the fact that during the first, and occasionally second, year of plantation trials there was insufficient seed material to make plantings at all localities. Yearly averages based on less than the total number of field trials cannot be considered as comparable to others based on the entire series of tests. For instance, during 1928 C. P. 807, as plant cane in the single test conducted, yielded at the rate of 50.86 tons of cane per acre. P. O. J. 213 in the same test yielded at the rate of 37.22 tons per acre, as compared with only 31.29 tons in the average of all tests during the year. Obviously, the C. P. 807 annual average of 50.86 tons per acre cannot be compared with the P. O. J. 213 average of 31.29, but instead is comparable with the yield of 37.22 tons. To show all yearly varietal averages in their true relationship would therefore require a rather complicated presentation, since there are numerous instances such as the above one, where a variety was included in fewer tests than the total number on which averages for other varieties are based.

In order to simplify the presentation of average results and at the same time render comparable the values shown, the average yearly results not derived from tests at all localities at which tests were conducted were adjusted for observed differences in average yield levels between the different sets of growing conditions in the following manner: The ratio between the average yield of cane per acre observed with any particular variety and the corresponding average observed

with the standard variety P. O. J. 213 was determined, and the annual average yield for the former variety was taken as a value bearing the same relationship to the yield obtained with P. O. J. 213 in the average of all tests. A similar adjustment was made in the case of yield of sugar per acre, and the yield of sugar per ton of cane was computed from the two values so obtained. Individual yields of sugar per ton of cane and per acre for Co. 290 and C. P. 807 published prior to the development of varietal correction factors to compensate for differences in milling qualities were also adjusted by the application of correction factors previously mentioned in this circular, thus placing varietal comparisons on a more satisfactory basis.

It is believed that with adjustments made as per above, the average yearly varietal yields shown are, for any given year, satisfactorily comparable. In comparing yields obtained during different years, however, it must be borne in mind that because of changes made in the number and location of test stations from year to year, annual averages are not strictly comparable. Averages given for 1926 and 1927 are based on relatively few tests and are definitely not comparable to results shown for succeeding years. Averages for 1928 and succeeding years are based on a larger number of tests affording a fairly good cross section of conditions prevailing in the Louisiana sugarcane district. While minor changes were made during that period, both with regard to the annual number of tests conducted and their location, the results for the different years therein may be regarded as more nearly comparable, and the yield fluctuations observed may be taken as largely reflecting the effects of variations in environmental conditions.

The annual results obtained with P. O. J. varieties definitely indicate a much lower order of productivity than can be expected with the more recently introduced C. P. and Co. varieties, thus thoroughly justifying the widespread abandonment of varieties of the former group.

Co. 290 stands out conspicuously as to yield of cane and yield of sugar per acre. This variety has consistently outyielded the P. O. J. varieties by differences ranging from more than 1 ton of 96° sugar per acre in plant-cane tests to approximately 2 tons of sugar per acre in second-stubble tests. While not among the highest in yield of sugar per ton of cane it has, in average annual results, afforded cane of higher milling value than the variety P. O. J. 213 under comparable conditions.

Average annual yields of sugar per acre obtained with C. P. 807 have been consistently below corresponding ones obtained with Co. 290. Except in the average plant-cane results obtained during 1931, and first-stubble results obtained during 1932, involving a relatively small number of tests, the average annual difference in favor of Co. 290 has been somewhat in excess of 1,000 pounds of 96° sugar per acre. Yields of sugar per ton of cane observed with C. P. 807 have been rather consistently below corresponding ones from P. O. J. 213.

Yields of sugar per acre obtained with Co. 281 have on the whole been definitely higher than corresponding ones from any of the P. O. J. varieties, with average differences usually ranging from 500 to 1,000 pounds. Its yields of sugar per ton of cane have been very generally higher than observed with either P. O. J. 213 or P. O. J. 36–M under similar conditions, and frequently as high as or higher

than observed with P. O. J. 234. It is, however, a relatively late maturing variety and has given the best results in tests harvested late in the season. In first- and second-stubble tests which were, on the whole, harvested during October and November, Co. 281 gave yields of sugar per ton of cane consistently below corresponding ones from P. O. J. 234 and occasionally below those obtained with P. O. J. 213. In plant-cane tests, however, which were harvested for the most part during December, it has generally afforded cane of milling value equal or superior to that of the variety P. O. J. 234.

In plant-cane tests extending over a period of 2 years, and in first-stubble tests during 1 year, C. P. 28/19 proved very slightly, but con-

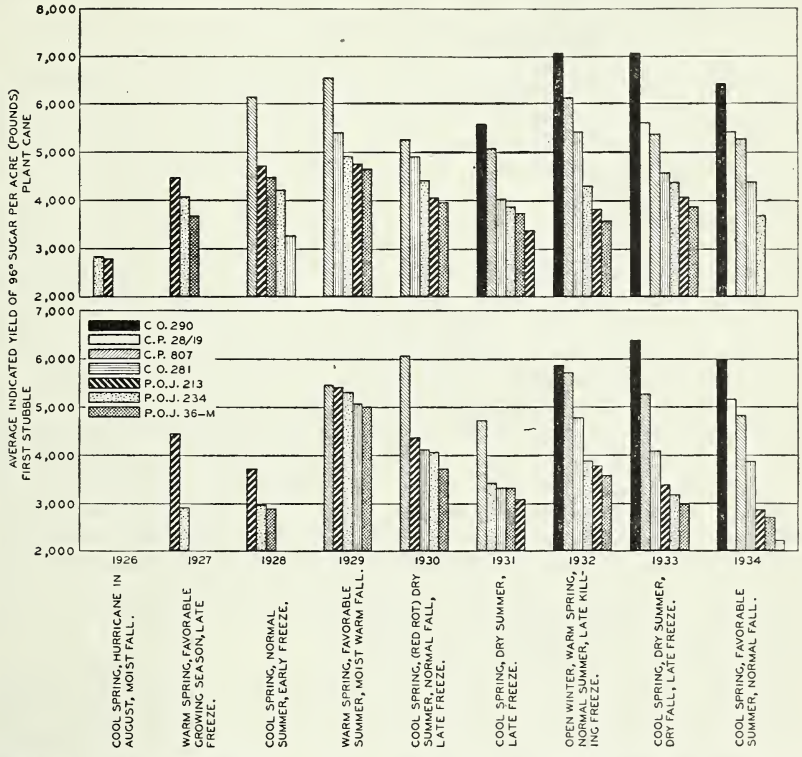

FIGURE 3.—Average annual yields of sugar per acre observed with important varieties of sugarcane in tests in Louisiana during the period 1926–34.

sistently, superior to C. P. 807 in average yield of sugar per acre, with yields of sugar per ton of cane consistently higher than obtained with P. O. J. 234 under comparable conditions.

Figure 3, in which annual average yields of sugar per acre given in tables 16 and 17 are graphically represented, shows concisely previously discussed varietal trends observed in the results of tests during the 9-year period. It is unquestionably significant that, with but few exceptions, the different varieties studied maintained quite similar relative positions in yearly average yield of sugar per acre in spite of wide fluctuations in actual yields. A notable exception to the latter observation is the yield relationship between P. O. J. 213 and

P. O. J. 234. In plant-cane tests during 1927 and 1928, P. O. J. 213 rather consistently maintained a lead of more than 400 pounds of sugar per acre over the corresponding yield from P. O. J. 234, while during the period 1930–33 annual average yields from P. O. J. 213 were from 300 to 500 pounds below those observed with P. O. J. 234. It is unquestionably significant that the latter period was coincident with the rapid spread of red rot in the variety P. O. J. 213.

While, as previously mentioned, averages between years are not strictly comparable, due to changes in test-station localities, notations as to important environmental factors affecting yields given in figure 3 throw interesting light on annual variations in average indicated yield of sugar per acre.

DISCUSSION AND CONCLUSIONS

The assortment of sugarcane varieties now available to Louisiana growers not only permits increased yields of sugar per acre on the principal agricultural areas but, in addition, renders possible a much more satisfactory utilization of the various types of soil used for sugarcane cultivation.

The proper balancing of plantings with regard to varieties presents a problem of extreme importance and deserves most careful study. Because of differences in local factors affecting the relative usefulness of the different varieties, it is obviously not possible to make recommendations which will uniformly apply to all growers. The ideal selection of varieties for localities on the northern edge of the sugarcane district, where the growing season is relatively short, will necessarily include a large proportion of early maturing varieties. This will also be true on muck soils and under other conditions conducive to delayed maturity. Where sufficient milling facilities are available to permit handling the crop in a relatively short period, the high yielding "midseason" varieties such as Co. 290 should figure prominently in the varietal assortment, while, on the other hand, where the available tonnage is such as to seriously tax milling facilities, it is highly important to devote a considerable portion of the acreage to early maturing varieties and to the variety Co. 281, which possesses definitely superior windrowing qualities.

The wide lead in yield of sugar per acre consistently maintained by Co. 290 over all other varieties tested definitely entitles the variety to prominent consideration in spite of its well recognized weaknesses. Its comparatively late maturing qualities and extreme susceptibility to injury by freezing definitely limit the period during which this variety may be successfully harvested under Louisiana conditions. It usually may be harvested to best advantage approximately between November 1 and December 1, when it ordinarily may be expected to afford cane of satisfactory maturity except under extremely unfavorable ripening conditions. As previously pointed out, the characteristically low fiber content gives this variety extremely favorable milling qualities. As an additional advantage might be mentioned its well-established characteristic of relatively high concentrations of available sugar in the lower portions of the stalk, thus usually permitting appreciable improvement in the milling quality of the cane by properly regulating the topping (*2*). As pointed out by Ingram and others (*8*), this variety has shown high resistance to sugarcane

beetle injury which greatly increases its usefulness in sections such as the vicinity of Franklin where severe damage from the latter source is usually experienced.

The value of C. P. 807 lies chiefly in its well-established ability to tolerate unfavorable growth conditions. It has been extensively grown with considerable success on poorly drained clay areas of which Sharkey clay is representative. Its susceptibility to red rot, however, as revealed by laboratory tests and occasional field results under extremely adverse conditions, has been a source of apprehension in connection with its widespread cultivation under conditions of poor drainage. Instances of rather severely impaired stands observed during the spring of 1935 following weather conditions conducive to the spread of red rot, while not approaching in seriousness stand failures experienced with P. O. J. 213 during 1930, plainly bear out this definite varietal weakness. Since Co. 290 is generally similar to C. P. 807 in its adaptability to soil conditions, and generally superior to the latter in sugar productiveness, both as to yields of sugar per ton of cane and per acre, it would seem advisable to substitute it gradually for the latter variety. If trends consistently maintained in tests conducted to date are borne out in the future, the ultimate general substitution of Co. 290 for C. P. 807 may prove desirable.

Co. 281 as indicated in results obtained by Balch and Lauritzen (*5*), possesses the very important quality of satisfactorily keeping in windrow to a degree not manifested by any other variety now being extensively cultivated. In order to mitigate freeze-damage hazards, it is obviously desirable to have available substantial quantities of cane which can readily be windrowed when deemed necessary or advisable. The factor of safety so introduced is of particular importance in cases where the quantity of cane to be milled is such as to prolong milling operations much beyond the expected date of the first damaging freeze.

While yields of sugar per ton of cane obtained with Co. 281 have been on the whole extremely satisfactory, especially during the latter part of the grinding season, yields of sugar per acre have been rather consistently below corresponding ones from either Co. 290, C. P. 28/19, or C. P. 807. Except for its valuable windrowing qualities, Co. 281 would not deserve extensive cultivation, but until a more satisfactory variety possessing its indispensable windrowing qualities is available, it will remain a very important one. As shown by Summers and Rands (*9*), mosaic, from which Co. 281 apparently does not usually recover once it becomes infected, has a very detrimental effect on the variety as indicated by greatly reduced yields of cane and sugar per acre. It is already becoming difficult to find cane of this variety not showing a comparatively high percentage of mosaic, and constructive suggestions made by the above-named investigators in connection with the obvious desirability of taking steps to maintain a seed supply reasonably free from mosaic are considered timely and of great importance in safeguarding the future usefulness of this valuable variety.

Results obtained with C. P. 28/19 fully confirm previous estimates of the variety. The extremely high yields of sugar per ton of cane, together with generally satisfactory yields of plant cane, first, and second stubble, render this variety a very valuable one for Louisiana cultivation in general, and particularly for early milling. The

superiority of this variety to P. O. J. 234 in yield of sugar per ton of cane at any harvest date has been conclusively demonstrated. Its superior productivity is indicated by the fact that it has quite generally given yields of sugar per acre in excess of comparable yields obtained with C. P. 807. On account of these obvious advantages C. P. 28/19 should completely displace P. O. J. 234 for early milling as soon as sufficient planting material is available. In addition, this variety, because of its superior productivity may possibly develop into an important midseason cane. Preliminary results indicate that it will be very satisfactorily adapted to conditions presenting difficult maturity problems such as for instance on reclaimed muck soils and on the Red River and Atchafalaya bottom soils in central Louisiana.

As pointed out in a statement by Brandes and others (*6*) at the time of its release for plantation-scale cultivation, C. P. 28/11 appears to be definitely inferior to C. P. 28/19 in yield of sugar per acre and per ton of cane. While it is true that the relatively poor showing made by C. P. 28/11 in comparison with C. P. 28/19 was undoubtedly due in part at least to relatively greater damage suffered as a result of a previously mentioned hurricane during June 1934, and that under more normal conditions the former variety may give relatively better results, it is likewise true that had the hurricane occurred later in the season the damage suffered by this susceptible variety would probably have been relatively greater. Its present utilization must be regarded as a temporary expedient to permit an earlier abandonment of P. O. J. 234 than would have otherwise been possible. C. P. 28/11 should be replaced by C. P. 28/19 as soon as a sufficient quantity of cane of the latter variety is available.

There appears to be no reason for the continued extensive cultivation of the varieties P. O. J. 36, P. O. J. 36–M, P. O. J. 213, and P. O. J. 234. Co. 290 has consistently surpassed, by extremely wide margins, yields of sugar per acre obtained with either P. O. J. 36, P. O. J. 36–M, or P. O. J. 213 and has proved rather consistently superior to all of them in yield of sugar per ton of cane. The results of all tests now available indicate that C. P. 28/19 will be a much more satisfactory variety than P. O. J. 234 for early milling. C. P. 807 and Co. 281 have also demonstrated qualities generally superior to those of P. O. J. 36, P. O. J. 36–M, and P. O. J. 213.

Preliminary results obtained with C. P. 29/291 and C. P. 29/320 have been on the whole more satisfactory than corresponding results obtained with Co. 281, but generally less satisfactory than obtained with C. P. 28/19. Since each of the former varieties have demonstrated, in laboratory and controlled field tests, pathological weaknesses not considered adequately manifested in the results of the above-mentioned tests, conclusive appraisals of the relative merits of these varieties must await the results of more extensive field trials.

A rather widespread and satisfactory utilization of the heavy clay soil areas of Louisiana has followed the development of adapted varieties. The varieties Co. 290 and C. P. 807 have shown definite merit under such conditions and, in addition, the results of limited tests indicate that C. P. 28/19 may also prove of value in the utilization of soils of this type.

Because of the usual inadequate drainage and the nature of the soil, transportation of cane from these low-lying clay areas presents a

difficult problem. Ordinarily such areas will not satisfactorily stand heavy traffic for several days following rainy weather. This is particularly true during the latter part of the grinding season when, due to the usual low temperatures, evaporation is greatly retarded. Obviously, therefore, harvesting under such conditions is closely dependent upon prevailing weather conditions, and it is generally considered expedient to avoid a late harvest date. It is, therefore, highly desirable that such areas be devoted to varieties which may reasonably be expected to afford cane of satisfactory milling value during the early part of the harvesting season. This detracts from the value of Co. 290 for cultivation under such conditions.

Under conditions conductive to delayed maturity this variety has occasionally afforded cane of relatively low milling value, and while it is true that during the past few years Co. 290 has consistently outyielded C. P. 807 in indicated available sugar per ton of cane, it is also true that the period in question has been characterized by levels of maturity generally above normal. Under adverse ripening conditions, Co. 290 may occasionally prove of unsatisfactory milling value during the early part of grinding when harvesting from these soil areas, if not imperative, is certainly highly desirable. Its extreme susceptibility to injury by freezing also presents an additional disadvantage because of the relatively lower minimum temperatures usually experienced on the low-lying dark-colored clay soils. The previously mentioned satisfactory response to topping observed with Co. 290, however, will, except in extreme cases, render it possible to secure cane of satisfactory milling quality by discarding upper immature portions of the stalk. The decided advantages demonstrated by this variety under normal conditions will probably fully justify such an occasional sacrifice in tonnage.

C. P. 807 has been cultivated in heavy clay areas for the past several years, with very satisfactory results both as to yield of cane and juice analyses during the usual period of harvest. Its previously mentioned susceptibility to red rot under laboratory and, occasionally, under field conditions introduces a certain factor of hazard in its cultivation under conditions characteristically favorable to the spread of red rot. Under very adverse winter conditions this variety may possibly give serious trouble under conditions of poor drainage, as indicated by instances of impaired stands observed in the spring of 1935.

If the apparent adaptability of C. P. 28/19 to heavy clay areas is confirmed by the results of future tests, the variety should prove of great value in this connection. Its early maturing properties will assure cane of satisfactory milling value during the period within which it is usually necessary to harvest. In addition, the high yield of sugar per ton of cane characteristic of this variety would be an additional advantage under the existing difficult hauling conditions.

The favorable results obtained with C. P. 28/19 on reclaimed muck soil in the two tests reported are considered of extreme economic importance. Extensive areas consisting of such soils were drained at considerable expense during comparatively recent years and subsequently abandoned for lack of a satisfactory crop affording revenues justifying original costs of drainage and necessary recurrent outlays for pumping and maintaining ditches and canals. Because of their high fertility such soils will usually produce very heavy yields of cane

without the use of fertilizer. Varieties now in general cultivation however have generally afforded cane of definitely uneconomic milling value, and the limited plantings in the past have been largely with the early maturing but extremely disease-susceptible variety, D–95. A variety combining satisfactory maturing qualities and a high degree of vigor and disease resistance, as is apparently the case with C. P. 28/19, should prove extremely valuable for such conditions, and the availability of such a variety of sugarcane should greatly increase the agricultural usefulness of these areas. Such a variety would fill a more or less similar role in the Red River and Atchafalaya bottom soils on the northern edge of the Louisiana sugarcane district.

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